

Transport Assessment

State Significant Development Application

Lot 4, Bringelly Road Business Hub, Leppington

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1 Introduction

1.1 Background

Ason Group has been engaged by ESR Australia (ESR) to prepare a Transport Assessment (TA) to support a State Significant Development (SSD) Application for an industrial warehouse development at Bringelly Road Business Hub (BRBH), Leppington.

BRBH is a new mixed-use precinct, of which the concept plan was granted approval in January 2016 (reference SSD-6324) to provide for 50,000m² of large format retail, 48,000m² of light industry and 5,000m² of service centre.

The BRBH will form 8 lots, with Lots 6 and 8 already being developed and Lot 3 recently being granted approval on March 2020 (reference: SSD-10366).

The SSD Proposal itself specifically seeks approval for a warehouse development at Lot 4 of BRBH (the Site), comprising:

- A warehouse total of 36,045m² gross floor area (GFA), including:
 - 34,570m² warehouse floorspace; and
 - 1,475m² ancillary office floorspace.
- On-site parking and servicing areas.

Full details of the Proposal are provided in the Environmental Impact Statement (EIS) which this TA accompanies.

1.2 Transport Assessment Objectives

The key objectives of this SSDA TA are as follows:

- To establish that the development of the Site, further to the Proposal, is compliant and consistent with the access, traffic and parking principles of the relevant codes and requirements.
- To establish that the trip generation of the Proposal can appropriately be accommodated by the local road network.
- To demonstrate that there is an appropriate and sustainable provision of car parking across the Site.
- To demonstrate that the proposed access driveways, internal roads, car parks and service facilities can provide a design compliant with the relevant Australian Standards.
- To demonstrate that the construction of the Proposal can be undertaken in an efficient and safe manner, and that construction vehicles can be appropriately accommodated by the local road network.

1.3 Secretary's Environmental Assessment Requirements

Secretary's Environmental Assessment Requirements (SEARs) were issued by the Department of Planning, Industry & Environmental (DPIE) on 11 Aug 2020 (Application Number SSD-8586218) regarding the Proposal and the broader Estate and include both general DPIE SEARs and more specific Transport for NSW (TfNSW) SEARs.

The DPIE SEARs relating to transport issues are outlined in **Table 1** below, while the TfNSW SEARs are outlined in **Table 2**; in both tables, Ason Group has provided a summary response to each SEAR, and reference to the section of this SSDA TA providing a more detailed analysis of each SEAR.

Table 1: Department of Planning, Industry & Environment SEARs

SEARs	TA Summary Response	SSDA TA Section Reference
a Traffic Impact Assessment detailing all daily and peak traffic and transport movements likely to be generated (vehicle, public transport, pedestrian and cycle trips) during construction and operation of the development, including a description of vehicle access routes and the impacts on nearby intersections	<p>This TA has assessed the forecast traffic generation of the Proposal once operational to be 73 trips in the AM and PM peak hours. The traffic generation has been determined with regard to RMS rates and relevant background traffic reports.</p> <p>Until such a time that a Contractor is on-board, it is difficult to confirm all the construction traffic requirements. However, it is anticipated that most of the construction vehicle movements will be outside of peak hour periods, with all staff arriving on-site outside of these critical times.</p> <p>Further, it is currently anticipated that, during the road network peak periods, construction of the Site could generate 4 trucks. This far reduced when considered against the forecast traffic generation associated with the operational development.</p>	Section 8.2 Section 9
details of access to the site from the road network including intersection location, design and sight distance	The site access location, design and sight distances have been provided for in compliance with the relevant standards. A reduced copy of the architectural plans is provided in Section 2.	Section 2 Section 10.1.2
an assessment of predicted impacts (including cumulative impacts from nearby surrounding development) on road safety and the capacity of the road network to accommodate the development including existing and future performance of nearby key intersections, including Bringelly Road/Skyline Crescent and Bringelly Road/Camden Valley Way/ Cowpasture Road	<p>As part of the BRBH TIA, the cumulative traffic generation and impacts of the BRBH on the local road network. The SIDRA results indicated that intersection of Bringelly Road & Skyline Crescent could maintain a Level of Service C in 2031 further to the provision of additional turning lanes from Bringelly Road.</p> <p>The traffic generation and modelling outputs were accepted by RMS (now TfNSW) and thus form the traffic 'budget' and traffic assessment criteria in which any future development within the BRBH should be validated against.</p>	Section 5.1
details of any road upgrades or new roads, roundabouts or intersections required for the development, including demonstration of consultation with the relevant roads authority on the proposed design	There are no road upgrades or new roads required as part of this Proposal.	N/A
details of vehicle circulation of the largest light and heavy vehicles anticipated to access the site, including swept path	Details of and swept paths analysis of the largest anticipated vehicles entering, exiting and manoeuvring within the Site's roads and loading bays are shown in Appendix A.	Appendix A Section 10

analysis, loading dock servicing and provisions		
detailed plans of the proposed site access and parking provision on site in accordance with the relevant Australian Standards	The car park access and parking provision are compliant with Australian Standards. For detailed plans, please refer to the architectural package submitted as part of this SSDA.	Section 10
identification of any dangerous goods likely to be transported on arterial and local roads to/ from the site and, if necessary, the preparation of an incident management strategy	It is not anticipated that any dangerous goods will be transported on arterial and local roads to/ from the Site.	N/A
impacts on the safety and capacity of the surrounding road network (including intersections along Bringelly Road and Cowpasture Road) and access points, using SIDRA modelling or similar to assess impacts from current traffic counts and cumulative traffic from existing and proposed development	The SIDRA analysis within the BRBH TIA indicated that the surrounding road network would operate safely in 2031. As above, the forecast traffic generation of the Proposal is within the acceptable traffic generation threshold identified as part of the BRBH TIA.	Section 5.1 Section 8
details of bicycle parking and end of trip facilities	The Proposal will provide 15 bicycle spaces, with end of trip facilities to be provided within the development. The bicycle parking has been provided with consideration for the minimum requirements of Liverpool DCP.	Section 7.2
details of impact mitigation, management and monitoring measures.	It has been concluded that the Proposal is acceptable from a traffic and transport perspective and therefore no mitigation measures are required.	N/A

Table 2: Transport for NSW SEARs

SEARs	TA Summary Response	SSDA TA Section Reference
1. Details of all traffic types and volumes likely to be generated by the proposed development during construction and operation, including a description of haul route origins and destinations, including:	-	-
a. Daily inbound and outbound vehicle traffic profile by time of day and day of week (if travel patterns differ across the week);	The Proposal will generate 73 trips in the AM and PM peak hours. The traffic generation has been determined with regard to RMS rates and relevant background traffic reports. As above, the construction traffic associated with the site during the peak hours is expected to significantly less than the operational development (Section 8.2).	Section 8.2 Section 9
b. Site and traffic management plan on how to manage number of vehicles likely to be generated during construction and operation and awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the surrounding road network. Without extending the site to Skyline Crescent, the proponent to demonstrate that internal road network at the existing site can	The traffic generated by the Site during construction will be managed through Traffic Control Plans (TCPs) and Traffic Controllers. The TCPs will be submitted as part of the final CTMP when the necessary approvals are in place and a builder is appointed. Once operational, the Site provides significant queuing space within the Site boundary and can accommodate all queuing activities (if required) onsite. Furthermore, an Operational Traffic Management Plan (OTMP) will be implemented to assist in managing safety and efficiency of the loading activities. It is expected that this could form a Condition of Consent relating to Occupation Certificate works.	Section 9

accommodate an increased in heavy vehicle traffics;		
c. Detailed plan of proposed layout of internal road network to demonstrate that the site will be able to accommodate movement of heavy vehicle load transport to the site and parking on site in accordance with the relevant Australian Standard and Council's Development Control Plan;	<p>Detailed plans of the car park layout and internal circulation and hardstand areas have been submitted as part of the architectural package of this SSDA. As illustrated by the swept path analysis in Appendix A, the Site is able to accommodate the anticipated heavy vehicle movements.</p> <p>Furthermore, car parking provision has been provided as per the rates outlined in the overarching BRBH SSDA approval. These rates require a minimum car parking provision of 152 car spaces; the Proposal seeks to provide 231 car spaces and therefore complies with the relevant controls.</p>	Appendix A Section 7.1
d. Swept path diagrams to demonstrate vehicles entering, exiting and manoeuvring throughout the site;	Swept paths analysis of the largest anticipated vehicles entering, exiting and manoeuvring within the Site are shown in Appendix A.	Appendix A
e. An assessment of the forecast impacts on traffic volume generated on road safety and capacity of road network including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic modelling software in accordance with the requirements set out in the Traffic Modelling Guidelines - TfNSW. The traffic modelling should consider the scenarios of year 2021 (existing condition), year of development completion and 10 years after development in operation. These should include, but not be limited to the following key intersections: <ul style="list-style-type: none"> i. Bringelly Road / Skyline Crescent; and ii. Bringelly Road/ Camden Valley Way / Cowpasture Road. 	<p>As part of the BRBH TIA, the cumulative traffic generation and impacts of the BRBH on the local road network. The SIDRA results indicated that intersection of Bringelly Road & Skyline Crescent could maintain a Level of Service C in 2031 further to the provision of additional turning lanes from Bringelly Road.</p> <p>The traffic generation and modelling outputs were accepted by RMS (now TfNSW) and thus form the traffic 'budget' and traffic assessment criteria in which any future development within the BRBH should be validated against.</p> <p>As per Section 8, the forecast traffic generation of the Site is within the acceptable threshold. Therefore, no further modelling has been undertaken to that already agreed and accepted within the BRBH TIA.</p>	Section 5.1
f. Detailed plans of any proposed road upgrades, infrastructure works or new road required for the development in order to mitigate any traffic impacts on the road network;	There are no road upgrades or new roads required as part of this Proposal.	N/A
g. Demonstrate how future uses of the development will be able to make travel choices that support the achievement of State Plan targets and develop a specific sustainable travel plan and list the provision of facilities that will be provided to increase the non-car mode share for travel to and from the site. Detail the measures to be implemented to promote sustainable means of transport including public transport usage and pedestrian and bicycle linkages;	<p>Due to the nature of the development, it is anticipated that the Proposal will rely heavily on private car usage.</p> <p>However, until such a time that the active and public transport network has become more established and is a more feasible form of transport for staff members especially, there is little benefit to developing any form of Green Travel Plan. It is note that the Site has been designed to respond to changes in the transport system (including provision of bicycle parking and end of trip facilities) and measures to encourage non-car travel will be implemented at a time that is appropriate, in consultation with the tenants of the buildings.</p>	N/A

h. To ensure that the above requirements are fully addressed, the traffic impact assessment must properly ascertain the cumulative study area traffic impacts associated with the development (and any other known or proposed developments within the Bringelly Road Business Hub);	This TA assess the cumulative traffic impacts of all developments (including approved and constructed developments) within BRBH.	Section 8.3
i. An assessment of the accessibility and provision of public transport and active transport; and	The accessibility of the Site to public and active transport infrastructure is assessed in Section 6.	Section 6
j. An assessment of construction traffic impacts on the adjacent road network.	See Section 9.	Section 9

1.4 Consultation

During the preparation of this TA, Ason Group has had contacted TfNSW to discuss key local transport issues and the scope of this TA. Given the period in which the application has been prepared, a response has yet to be received. However, Ason Group can be available to discuss the Proposal with TfNSW as required.

1.5 Reference Documents

1.5.1 Planning Guidelines

The Site lies within the Liverpool City Council (Council) Local Government Area (LGA); as such, Ason Group has referenced the following key Council controls in preparing this TA:

- Liverpool Local Environmental Plan 2008 (Liverpool LEP); and
- Liverpool Development Control Plan 2008 (Liverpool DCP).

1.5.2 General Policies & Guidelines

Ason Group has referenced the following additional policies and guidelines relevant to the assessment of the Proposal:

- Roads and Maritime Services (RMS) Guide to Traffic Generating Developments 2002 (RMS Guide).
- Roads and Maritime Guide to Traffic Generating Developments Updated Traffic Surveys, August 2013 (RMS Guide Update).
- Australian Standard 2890.1: Parking Facilities – Off-Street Car Parking (AS 2890.1).
- Australian Standard 2890.2: Parking Facilities – Off-Street Commercial Vehicle Facilities (AS 2890.2).
- Australian Standard 2890.6: Parking Facilities – Off-Street Parking for People with a Disability (AS 2890.6).

1.5.3 Reference Reports

Finally, a number of traffic and transport assessments relevant to the broader local road network are available by which to assess future 'base' road network conditions, which Ason Group has also specifically referenced in preparing this TA. These include:

- Transport and Traffic Planning Associates (TTPA), *Bringelly Road Business Hub Traffic Impact Assessment*, December 2014 (BRHB TIA).
- TTPA, *Proposed Bunnings Development Traffic and Parking Assessment*, November 2019 (Bunnings TIA).
- TTPA, *Proposed Nulon Motor Oil Facility, Assessment of Traffic and Parking Implications*, December 2017 (Steelforce TIA). Note that Steelforce Australia actually occupy the Site.
- TTPA, *CFC Group Proposed Warehouse and Showroom Facility*, September 2018 (CFC TIA).
- AECOM, *Bringelly Road Upgrade Review of Environmental Factors*, September 2011 (BR AECOM report).

2 The Proposal

2.1 Overview

To summarise, the Proposal provides for the following:

- A warehouse development totalling 36,045m² GFA, including:
 - 34,570m² warehouse floorspace; and
 - 1,475m² ancillary office floorspace.
- On-site parking and servicing areas.

The Proposal is shown in **Figure 1**, whilst the Site within the broader BRBH is shown in **Figure 2**.

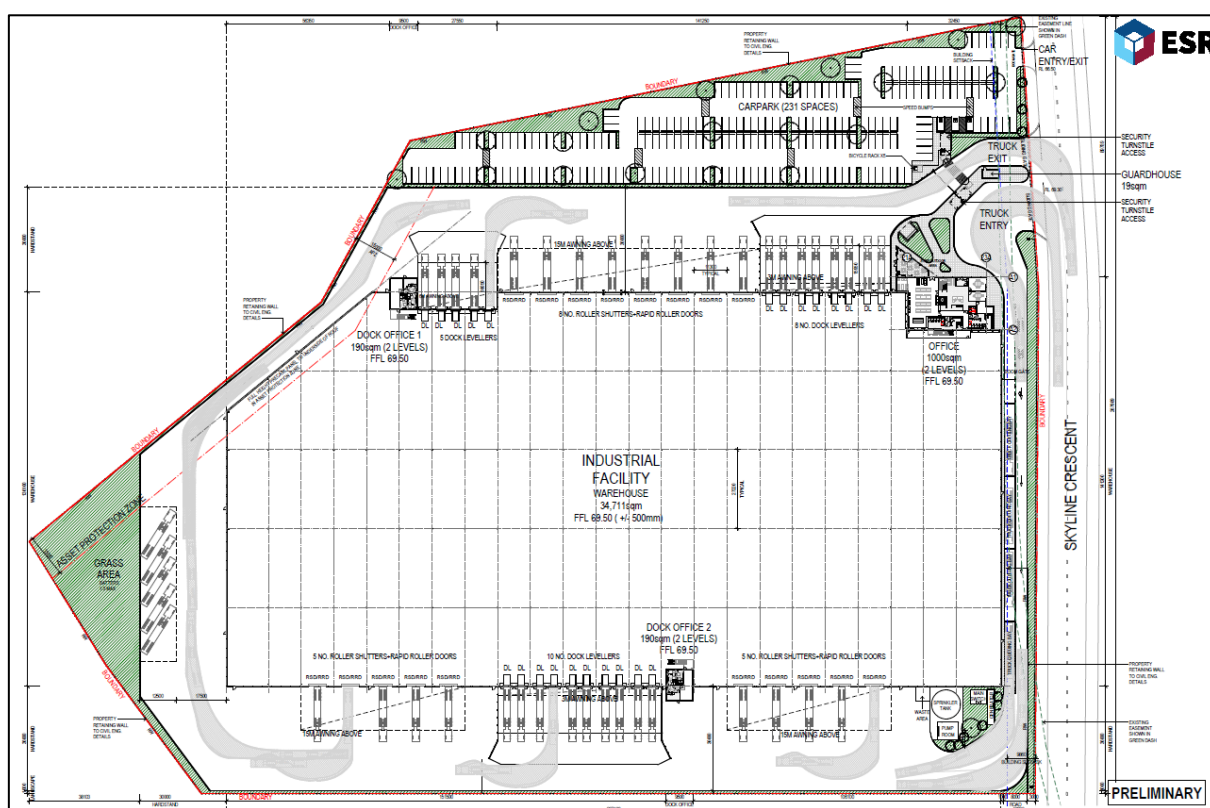


Figure 1: Proposed Development – Site Plan

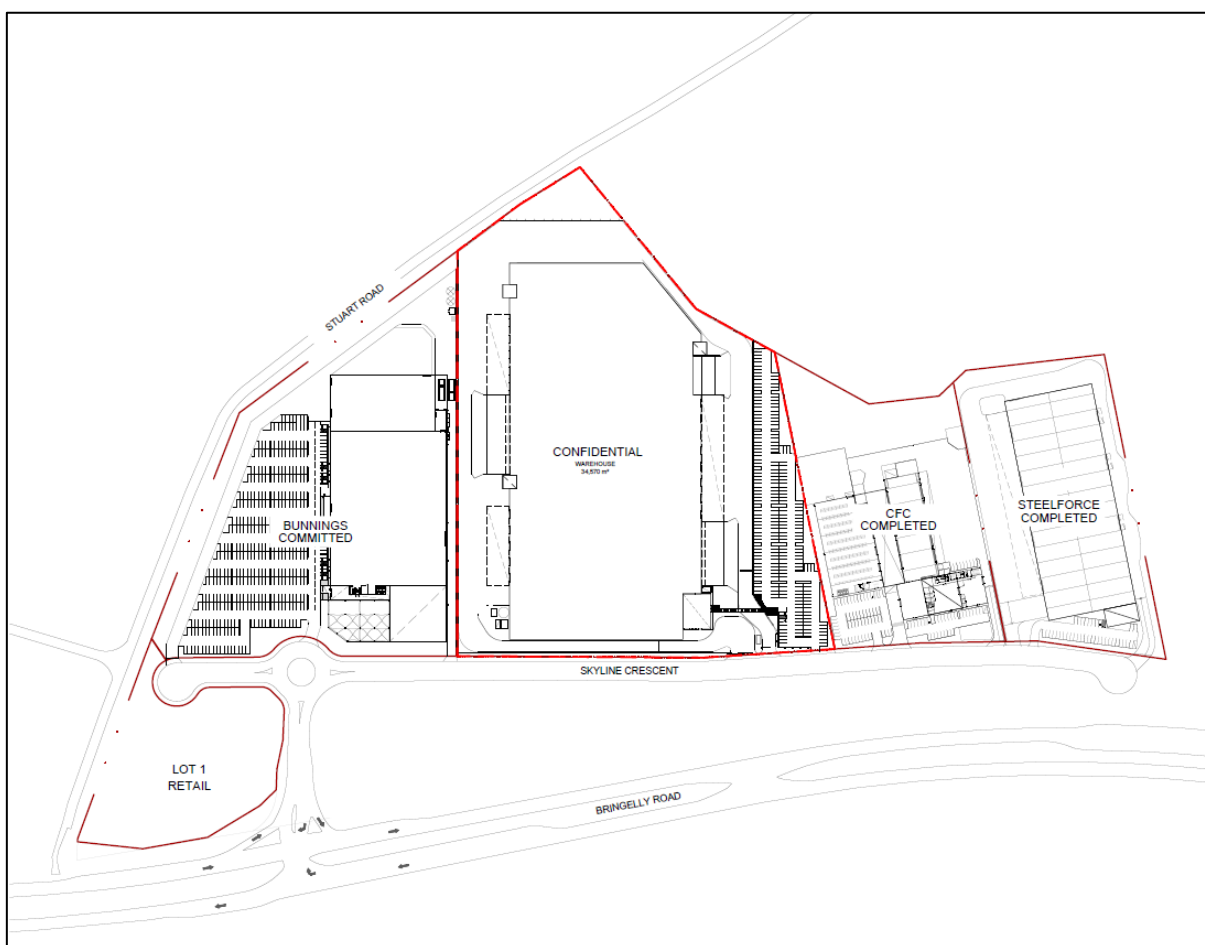


Figure 2: The Site and Bringelly Road Business Hub

3 The Existing Site

3.1 Location

The Site is located at Lot 4, BRBH, Leppington, has an area of approximately 69,740m² and currently consists of undeveloped land. The Site is bounded by Stuart Road to the north, Skyline Crescent to the south, a warehouse and showroom facility operated by CFC Group (CFC) to the east and undeveloped land to the west, which was recently approved for a Bunnings development (reference SSD-10366).

The Site is located approximately 10km south-west of Liverpool, 14km south-east of the future Western Sydney International (Nancy-Bird Walton) Airport (WSA), 26km south-east of the Penrith CBD and 36km west of the Sydney CBD.

The Site is shown in its sub-regional context in **Figure 3**.

3.2 Site Access

The Site has a direct frontage to Skyline Crescent along the southern boundary, which currently provides numerous private driveways for access to adjacent developments. Skyline Crescent connects to the wider road network via Bringelly Road.

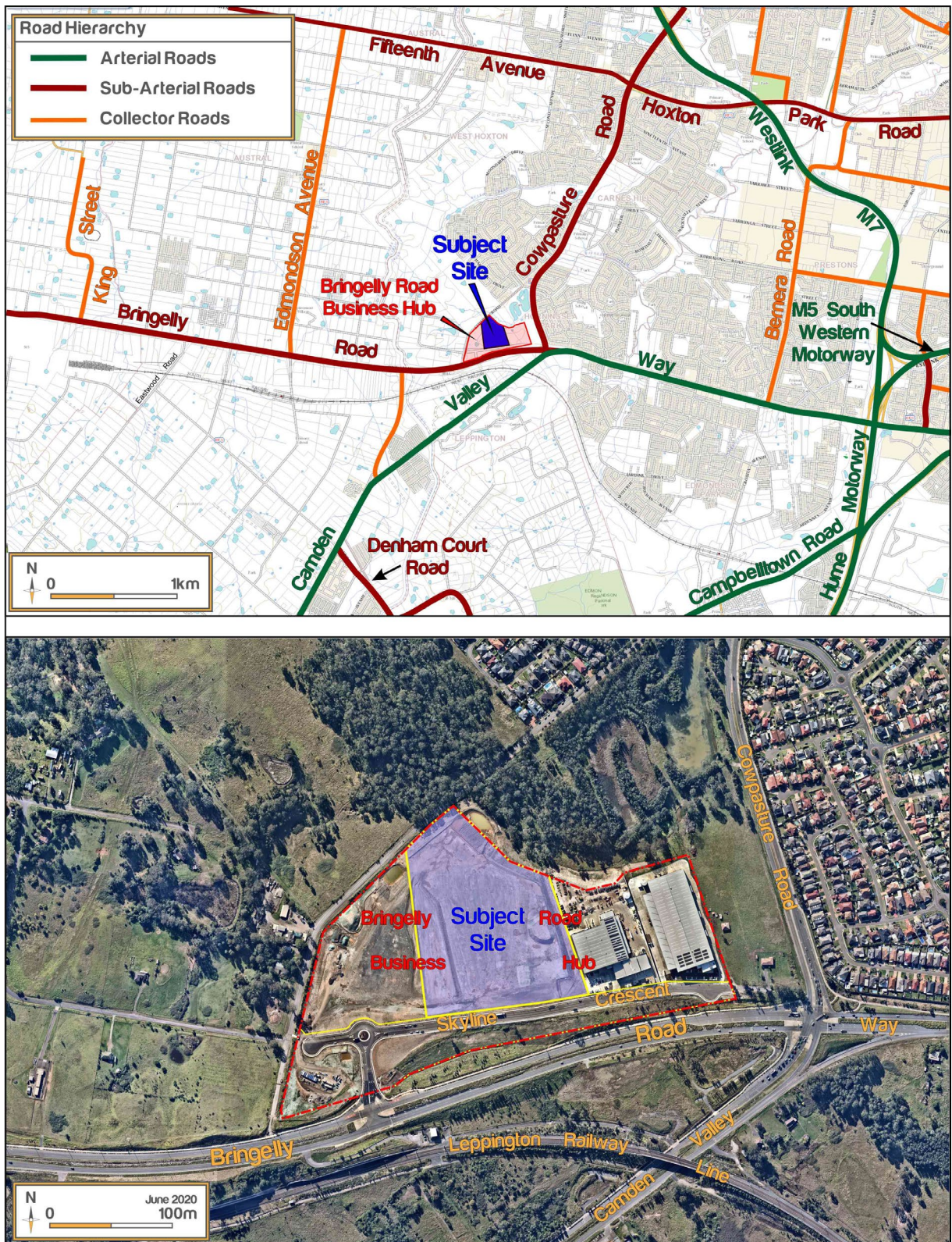


Figure 3: Site Location

4 Existing & Future Road Network

4.1 Key Roads

The existing road network providing access to the Site is also shown in Figure 3, and detailed further below.

4.1.1 Bringelly Road

Bringelly Road is a classified State Road (MR 647) which generally runs in an east-west direction between Campden Valley Way / Cowpasture Road in the east and The Northern Road / Greendale Road in the west. In the vicinity of the Site, it generally provides 2 traffic lanes in each direction, with a posted speed limit of 80km/h.

4.1.2 Camden Valley Way

Camden Valley Way is a classified State Road (MR 620) which runs between Campbelltown Road in the east and Narellan Road in the west. In the vicinity of the Site, it generally provides 2 traffic lanes in each direction, with a posted speed limit of 70-80km/h.

4.1.3 Cowpasture Road

Cowpasture Road is a classified State Road (MR 648) which generally runs in a north-south direction between The Horsley Drive in the north and Camden Valley Way in the south and also provides a key intersection with the M7. In the vicinity of the Site, Cowpasture Road provides 2 traffic lanes in each direction and has a posted speed limit of 70km/h.

4.1.4 Stuart Road

Stuart is a local road running through the Merrylands Centre between Treves Street and Pitt Street; it generally provides 2 traffic lanes for two-way traffic, separated by a central median. McFarlane Street provides angled on-street parking bays on both sides of the road, and has a posted speed limit of 40km/h.

4.1.5 Skyline Crescent

Skyline Crescent is a local road with access from Bringelly Road. It generally runs in an east-west direction between Bringelly road to the east and a cul-de-sac to the west. It provides 1 traffic lane in each direction and on-street parking on both sides of the road.

Skyline Crescent forms the southern frontage to the Site and provides vehicular access to the developments of BRBH.

4.2 Traffic Flows

Due to the extensive development of the surrounding areas, traffic flows on Bringelly Road are everchanging. As part of the Bunnings TIA, TTPA determined the base traffic flows on Bringelly Road with reference to traffic volumes forecasted in the BR AECOM report. **Table 3** provides the traffic flows forecast by AECOM on Bringelly Road west of Camden Valley Way.

Table 3: Bringelly Road Forecast Traffic Flows

Year	AM		PM	
	EB	WB	EB	WB
2016	1,075	685	765	1,136
2021	1,752	945	1,039	1,728
2026	2,148	1,211	1,257	2,320
2031	2,855	1,323	1,296	2,958
2039	3,719	1,274	1,408	3,889

Source: Bunnings TIA, TTPA, 2019

4.3 Western Sydney Infrastructure Plan

While the Site lies to the east of the Western Sydney priority precincts – including the Western Sydney Employment Area WSEA); Western Sydney Aerotropolis (WSA); and South West Priority Growth Area (SWPGA) – much of the key transport infrastructure which will support the Site is provided for in the Western Sydney Infrastructure Plan (WSIP). Key WSIP projects include:

- The construction of the new M12 Motorway which will provide direct access to the Western Sydney Airport at Badgerys Creek.
- The upgrade of Bringelly Road to a minimum of 4 lanes between The Northern Road and Camden Valley Way. Construction on the upgrade commenced in early 2015 and has since been completed.
- The upgrade of The Northern Road to a minimum of 4 lanes between The Northern Road, Narellan and Jamison Road, South Penrith. Construction on the upgrade of The Northern Road is currently underway.
- Construction of the Werrington Arterial Road by upgrading Kent Road and Gipps Street to 4 lanes between the Great Western Highway and the M4. This project was completed in May 2017;
- Upgrade of the intersection of Great Western Highway & Ross Street at Glenmore; this project was completed in late 2018; and
- A \$200 million package for local roads upgrades across Western Sydney.

The key WSIP projects are shown in **Figure 4**, while key projects specifically relevant to this assessment are detailed further in sections below.

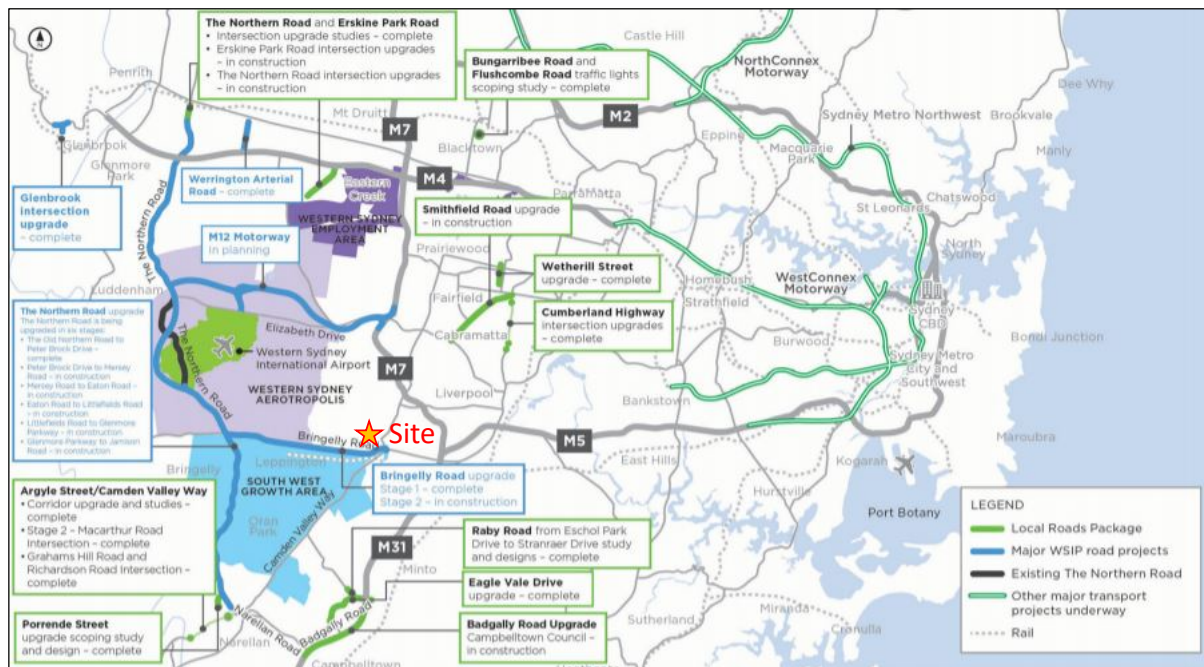


Figure 4: Western Sydney Infrastructure Plan Road Network Upgrades

4.4 Bringelly Road Upgrade

The Bringelly Road upgrade (BR Upgrade) will deliver upgraded capacity and safety for the section of road between Camden Valley Way and The Northern Road. The BR Upgrade will provide 4 – 6 traffic lanes through the Leppington Town Centre, and introduce a number of new or upgraded signalised intersections.

- The BR Upgrade is being delivered in two stages. The Stage 1 works between Camden Valley Way and King Street and is fully completed, while Stage 2 works relate to the section of road between King Street and The Northern Road; and an upgrade of the Bringelly Road and Northern Road interchange.

The BR Upgrade (Stage 1) is shown in **Figure 5**.

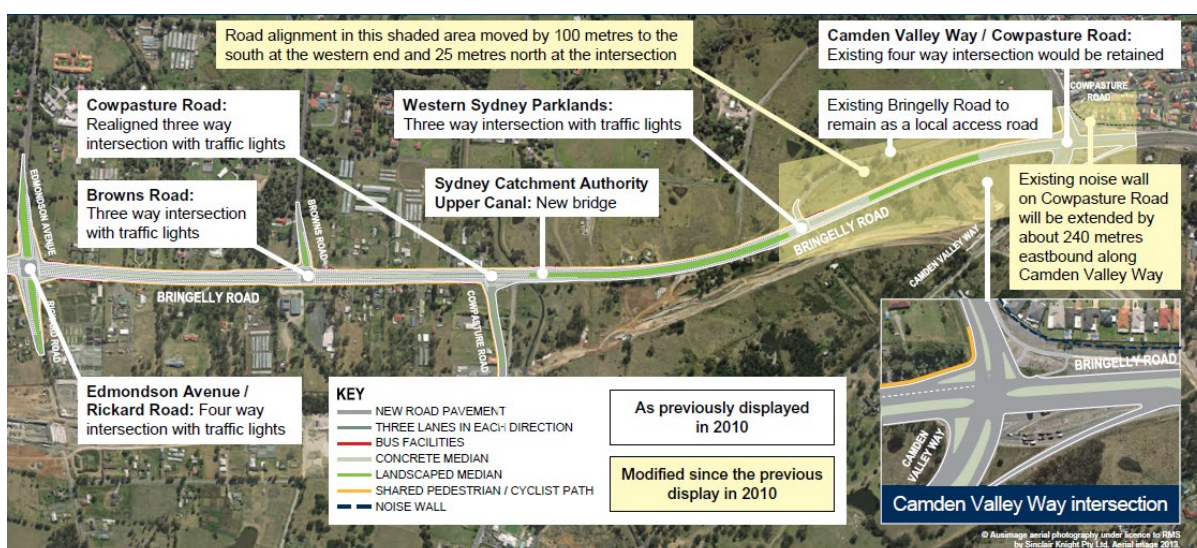


Figure 5: Bringelly Road Stage 1 Upgrades

Stage 2 of the BR Update comprises the following key items:

- Upgrading to four lanes (from the existing two).
- Addition of a central median strip to allow future road widening to six lanes.
- 80km/h speed limit.
- Pedestrian/cycleway alongside the road.
- Additional pedestrian crossings.
- Indented bus stops down both sides of the road.
- Seven new intersections or changes to old ones, with installation of traffic lights.
- New bridges over South Creek.

The upgraded intersection of Bringelly Road and The Northern Road opened on 16 July 2020.

5 Strategic Context

5.1 Bringelly Road Business Hub

5.1.1 Overview

BRBH is located at the northwest corner of the intersection of Bringelly Road, Camden Valley Way and Cowpasture Road in Horningsea Park. The concept plan covered by SSD-6324 was approved in January 2016 and provides for the following:

- Large format retail uses (50,000m²);
- Light industrial use (48,000m²); and
- Service centre uses (5,000m²).

5.1.2 Traffic Generation

The traffic impacts of the BRBH were assessed within the BRBH TIA, prepared by TTPA. The BRBH TIA predicted that the BRBH would generate a total of 536 trips and 1,064 trips in the AM and PM peak hours, respectively, based on adoption of trips rates derived either from the RMS Guide or independent surveys. Once passing trade, linked trips and the low activity expected in the morning peak for the retail uses was considered, this reduced the forecast traffic generation.

Therefore, based on the above yields, a total additional traffic generation was forecast of 508 vehicles per hours (vph) in the morning peak and 977 vph in the evening peak hour, respectively.

The concept plan was ultimately approved and the impacts of the above traffic generation has been considered to be acceptable. Therefore, this peak period volume forms the traffic 'budget' or 'threshold' in which any future development within the BRBH should be assessed against.

5.1.3 BRBH Intersection Performance

The BRBH TIA reviewed the site access (Skyline Crescent) / Bringelly Road intersection with consideration of the BR Upgrade (4 lanes with a wide median) as well as the future increase in traffic lanes from 4 to 6 lanes by 2031. The BRBH TIA assessed the following 2 options:

- **Option A** – RMS intersection design with 4 lanes and 6 lanes with single right-turn lane and limited access road capacity
- **Option B** – Alternative (ultimate) design with 4 lanes and 6 lanes with two right-turn lanes and 3 egress lanes (2 right-turn and 1 left-turn slip lanes).

Under Option A, with only 4 through lanes on Bringelly Road, the intersection was forecast to operate at a Level of Service (LOS) D in the morning peak and LOS F in the evening peak by 2031. The addition of a through lane in either direction improved the performance of the intersection to LOS B and C in the morning and evening peaks, respectively.

Under the Option B scenarios with 4 lanes on Bringelly Road, 2 right-turn lanes into the Site and 2 right-turn (and 1 left-turn slip) lanes out of Skyline Crescent, the intersection performance was forecast to be LOS C in both morning and evening periods.

RMS initially provided concern with providing the full (ultimate) intersection under Option B, and therefore Option A was to be considered as an interim solution, with upgrade requirements ultimately to relating to the BRBH realising the full traffic generation by 2031.

Ultimately the BRBH was approved with an intersection design as shown in **Figure 6**.

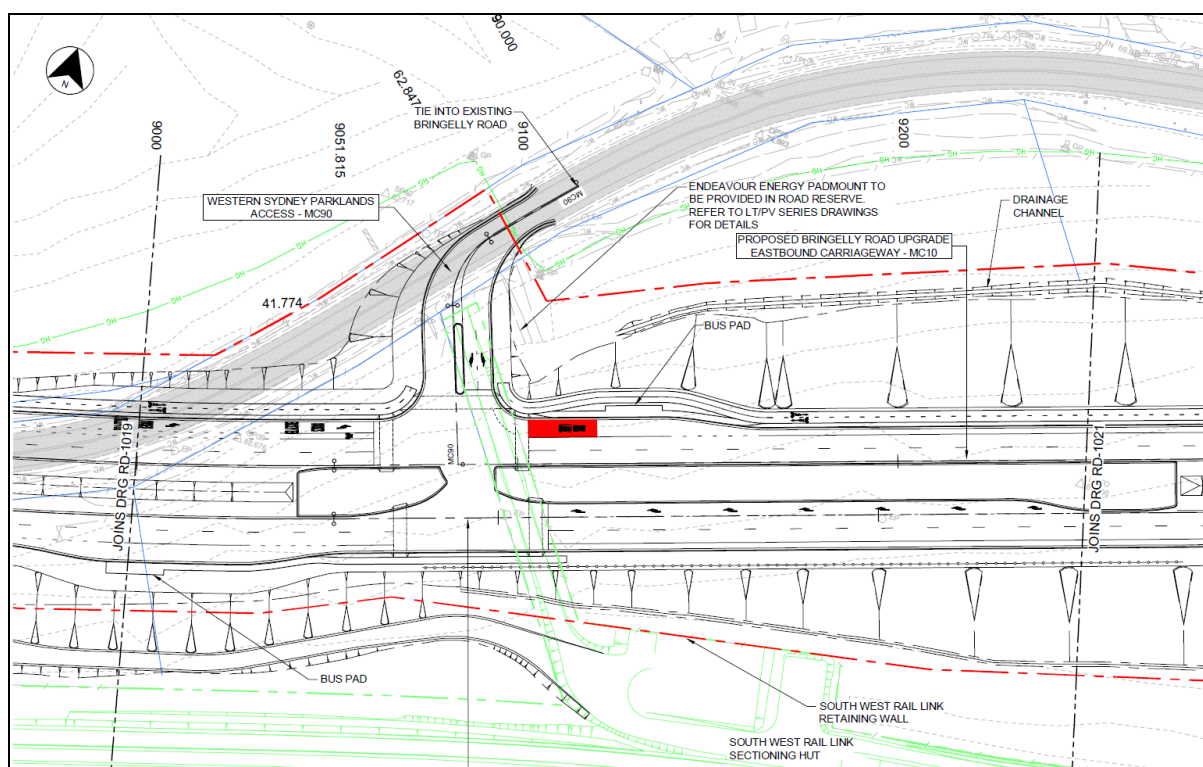


Figure 6: Approved Intersection Bringelly Road & Bringelly Road Business Hub

This intersection has since been fully constructed and is now operational. It was originally completed (in late 2019 / early 20202) as per Option A of the BRBH TIA, with a single right-turn bay into and out of Skyline Crescent. This is illustrated by the TCS plan provided as shown in **Figure 7**. However, it is critical to note that, since this time, additional right turn bays into and out of Skyline crescent have been added, as per Option B assessed in the BRBH (**Figure 8**).

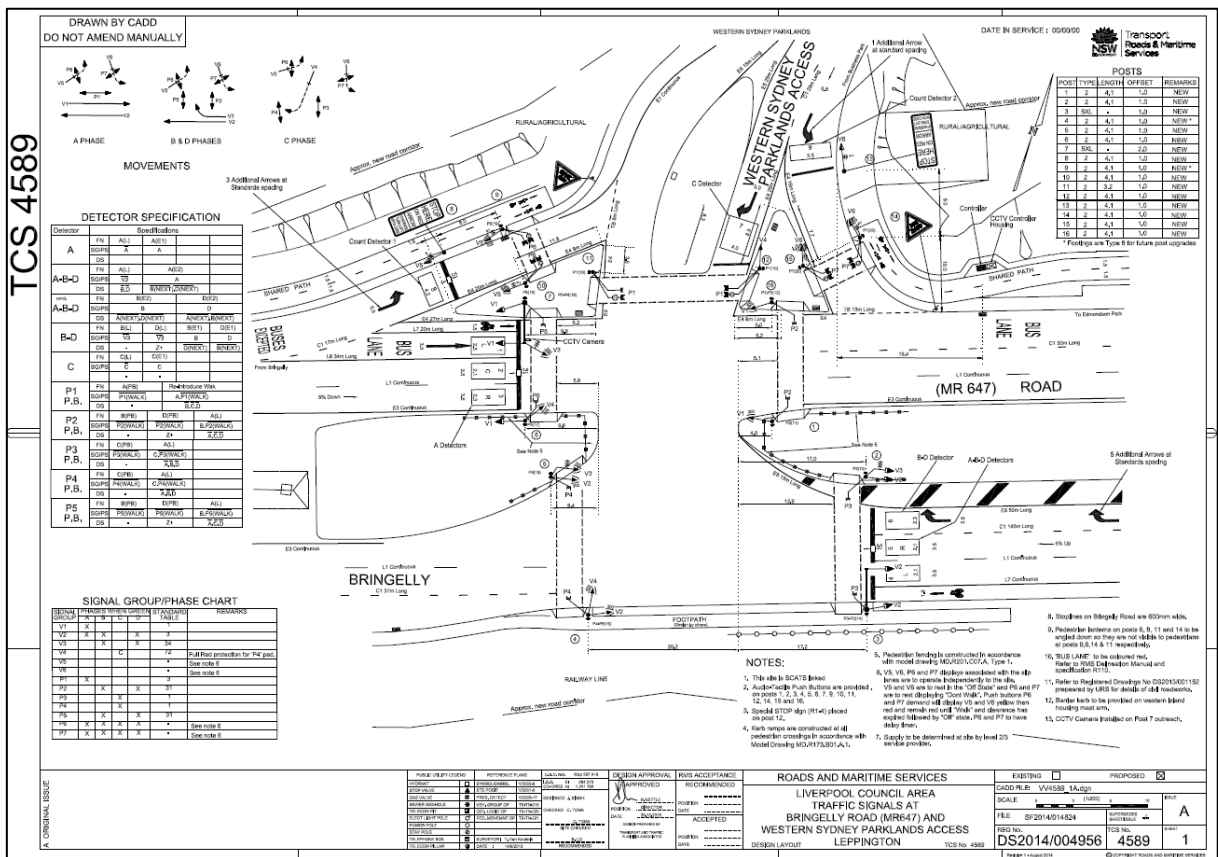


Figure 7: Intersection Bringelly Road & Skyline Crescent – TCS Plan



Figure 8: Current Bringelly Road & Skyline Crescent Intersection (Source: Nearmap, June 2020)

6 Public & Active Transport Opportunities

Currently, the Site is provided with poor access to public and active transport services, which are shown in **Figure 9** and described further in sections below.

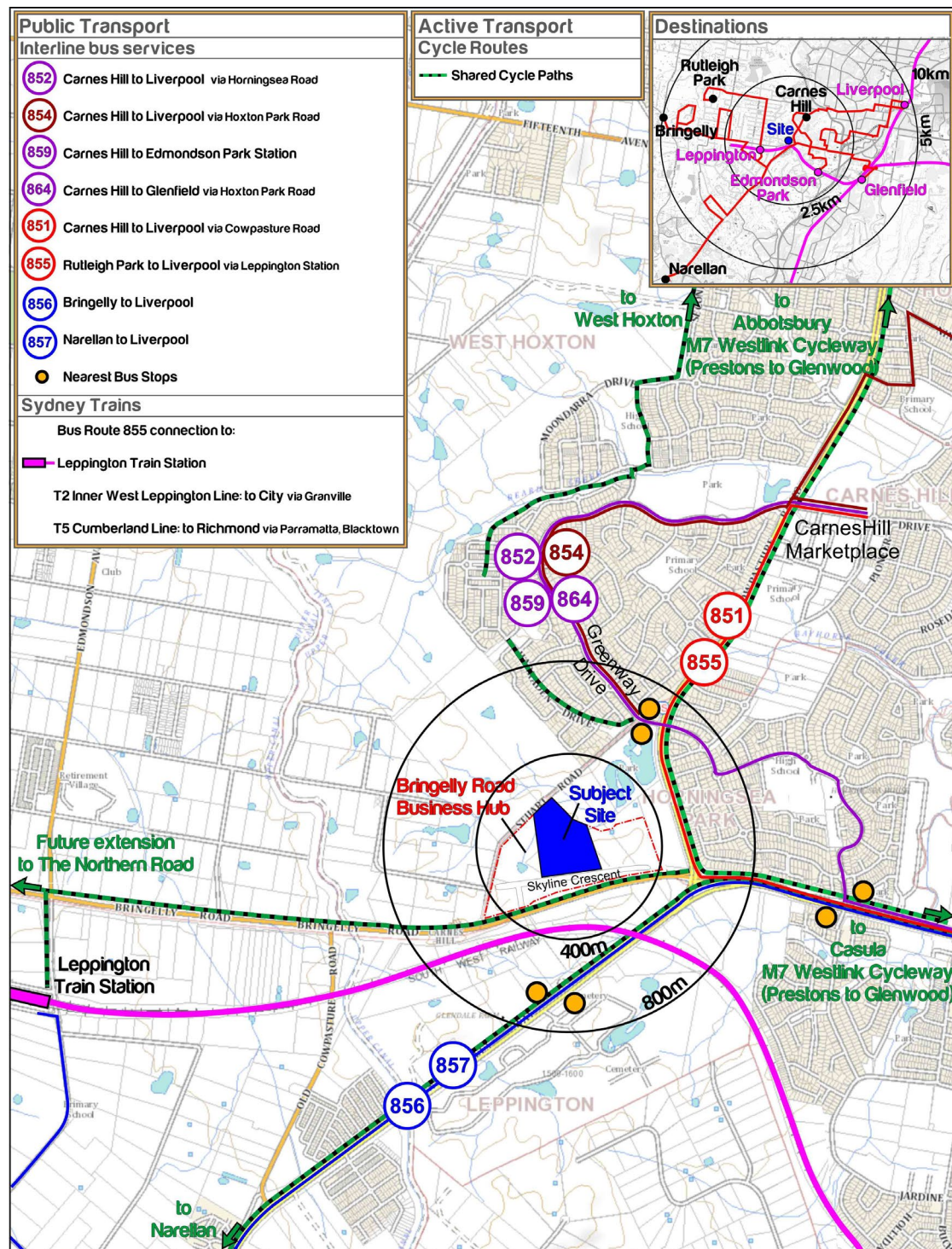


Figure 9: Public Transport Services

6.1 Rail / Metro

The IPT Guidelines state that train services influence the travel mode choices of areas within 800 metres distance (approximately 10 minutes' walk) of a train station.

The closest railway station to the Site is Leppington train station, which services the T2 Inner West & Leppington Line and T5 Cumberland Line.

Leppington train station is located some 3.7km from the Site and is therefore outside the standard walking distance of 800 metres as per the IPT Guidelines.

6.2 Bus Services

6.2.1 Existing

The IPT Guidelines state that bus services influence the travel mode choices of sites within 400 metres walk (approximately 5 minutes) of a bus stop, as shown in **Figure 9**.

Bus services operating around the Site include bus routes 851, 852, 854, 855, 856, 857, 859 and 864 with bus stops located on Camden Valley Way, Horningsea Park Drive and Joshua Moore Drive. These bus routes are currently serviced by bus stops which are outside the 400 metres walking distance required by the IPT Guidelines.

6.2.2 Future

The planning of bus services in Sydney is governed by the *NSW Service Planning Guidelines*, which aim to establish Strategic Transport Corridors and a hierarchy of bus route types that:

- Link to regional centres (such as Penrith and Mt Druitt);
- Pass through patronage generators such as district centres, TAFE colleges, hospitals and universities;
- Connect with other transport modes (trains, ferries and other buses);
- Are multifunctional (serving journeys to work, education, shopping and recreation);
- Are direct and frequent; and
- Meet the network planning principles.

It is also the case that the establishment of public transport services as early as possible in the development stages of the BRBH is important to achieve a culture of public transport use from the outset. To make public transport a viable choice in the study area, the services will ideally:

- Integrate with existing bus services in the area;
- Connect to regional centres of Penrith, Mt Druitt and Blacktown; and
- In the long term, connect to areas such as Leppington in the South West Growth Centre, Prairiewood and the Liverpool to Parramatta T-Way.

As part of the BR Upgrade works, a new bus stop is to be provided on Bringelly Road, just east of the intersection with Skyline Crescent. As is shown by Figure 8, provided has been made for the pedestrian amenities required for the bus stop. It is expected that this bus stop will be utilised as part of an extension for existing bus services or for future services.

As such, there are significant opportunities to provide sub-regional services along Bringelly Road which would help establish a culture of utilising public transport and would reduce the reliance of private car usage.

Key bus routes identified in the Broader Western Sydney Employment Area (BWSEA) Structure Plan are shown in **Figure 10**.

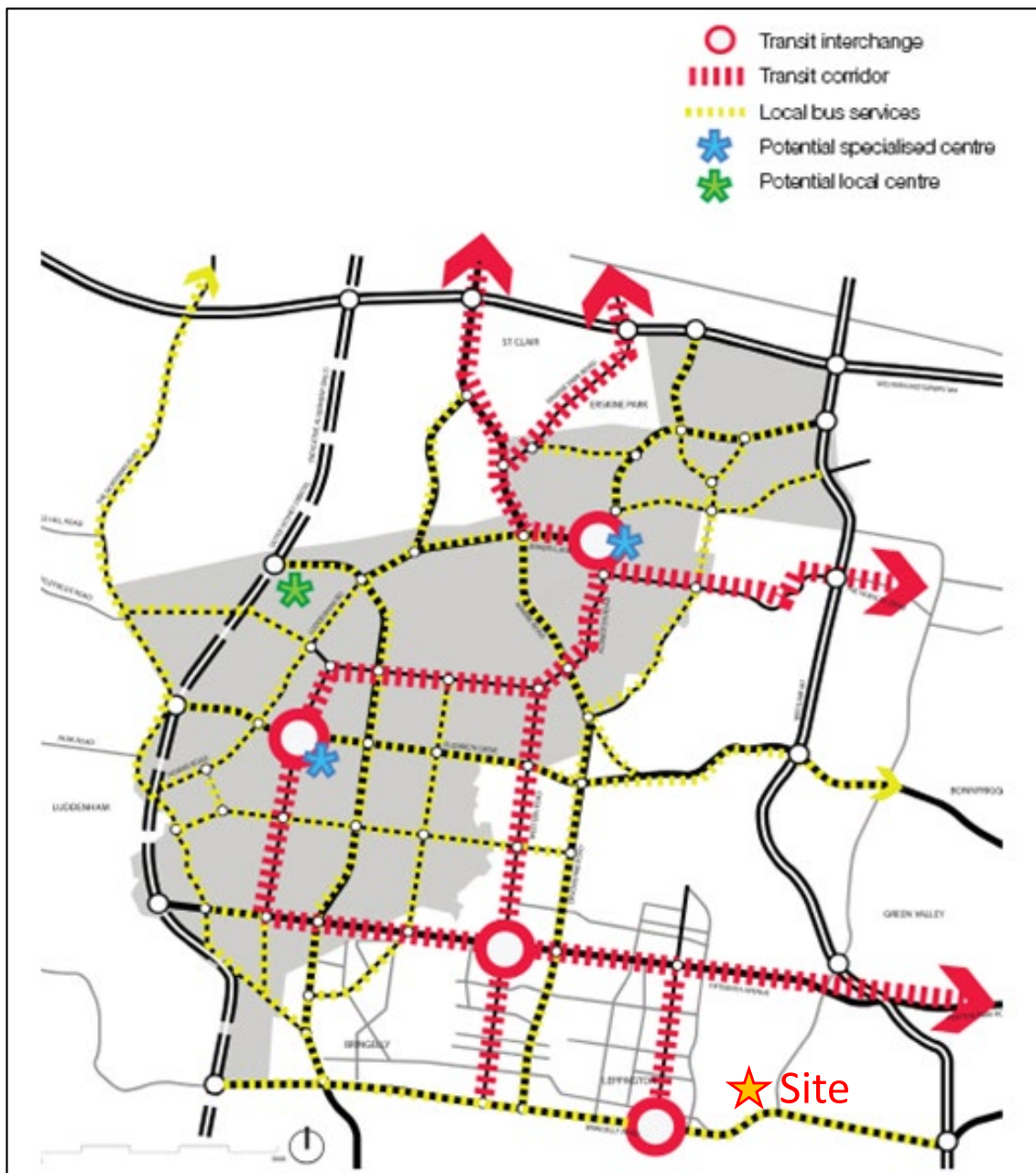


Figure 10: BWSEA Bus Network

Source: BWSEA Structure Plan

6.3 Cycling Network

At present, shared paths (pedestrian and cycle) are provided along Bringelly Road, Cowpasture Road and Camden Valley Way.

The BWSEA Structure Plan provides a detailed outline of future active transport objectives and strategies, acknowledging that the provision of such will be essential to encourage the use of active transport from the outset. In this regard, the BWSEA provides the following key objectives:

- *Provide quality pedestrian and cycling environments around transit corridors and facilities.*
- *Understand the key walking and cycling needs in the region and the need for the separation of pedestrians and cyclists from motor vehicle traffic.*
- *Recognise that all trips involve walking at either the beginning or end of the journey, resulting in the need for connections between parking and public transport areas and destinations.*
- *Recognise that walking and cycling paths can form key routes between destinations.*
- *Understand that walking and cycling trips perform a variety of functions, not only travel from an origin to a destination, but such trips are also undertaken for recreation and/or health benefits, which can be influenced by the amenity of the route.*

Key active transport routes identified in the BWSEA Structure Plan are shown in **Figure 11**, which indicates that there are plans to provide a future off-road cycling facility in the vicinity of the Site. It is noted that some of these facilities, such as the off-road cycleway on Bringelly Road, have already been completed.

6.4 Pedestrian Network

The Site provides a high level of pedestrian connectivity, including immediate and safe connections to public transport services and surrounding residential precincts. Footpaths are provided on Skyline Crescent, Bringelly Road, Cowpasture Road and Camden Valley Way, and are all of a high quality with regard to appropriate widths and ramps.



Figure 11: BWSEA Active Transport Network

Source: BWSEA Structure Plan

7 Parking Assessment

7.1 Car Parking

7.1.1 BRBH SSDA Approval

Parking for the Proposal is to be provided with regard to Condition B10 of the BRBP SSD Approval.

Table 4 details the relevant parking rates for warehouse development, as per Condition B10.:

Table 4: BRBH Approved Minimum Car Parking Requirements

Land Use	Minimum Car Parking Requirements
Warehouse	1 space per 300 m ² of warehouse GFA.
Office	1 space per 40 m ² of office GFA.

Based on these rates, the Proposal requires a total of 152 parking spaces, including:

- 115 spaces for the warehouse component of the Site; and
- 37 spaces for the office component of the Site.

The Proposal provides a total of 231 parking spaces and as such, provides full compliance with the required rates.

7.1.2 Accessible Car Parking

Liverpool DCP provides the following in regard to accessible parking:

- a) *Accessible parking must be provided in accordance with the provisions of the Building Code of Australia and relevant Australian Standards.*

In this regard, 1 accessible parking space has been provided for every 100 spaces, therefore providing compliance with the Disability (Access to Premises – Buildings) Standards 2010 from the BCA, as well as the accessible parking requirements provided in Appendix B of AS 2890.6.

7.2 Bicycle Parking

Part 20.3 of Liverpool DCP requires that bicycle parking be provided at a rate of 1 bicycle space per 10 staff. Application of this rate to the maximum number of staff on-site at any given point (150 staff) results in a requirement for 15 bicycle spaces.

The Proposal will provide a total of 15 bicycle parking spaces and therefore compliance with Liverpool DCP.

8 Traffic Assessment

8.1 Trip Rates

The BRBH TIA adopted the RMS Guide peak hour traffic generation rate of 0.5 vehicles per 100m² GFA. However, the RMS Guide Update indicates a peak hour rate of 0.202 vehicles per 100m² for sites displaying the similar characteristics of (large scale) industrial development, including the Erskine Park and Wonderland Business Parks. Ason Group has considerable experience working on industrial developments across Sydney where a similar rate has been adopted.

Furthermore, this rate is consistent with the rate adopted in the Steelforce TIA for a light industrial development (0.2 trips per 100m²), the development of which was ultimately approved.

Therefore, this rate has been adopted for the purposes of assessment of the Proposal, noting that it is anticipated that the Proposal would ultimately be a traditional warehouse development, rather than a large format retail development or factory. This traffic generation rate is based on a total of all GFA within the Site and includes warehouse and office GFA.

8.2 Site Traffic Generation

Further to the adoption of the RMS Guide Update trip rate as described above, **Table 5** provides a summary of the Site's traffic generation further to the Proposal.

Table 5: Proposal Traffic Generation

GFA (m ²)	Trip Rate	Trips per hour
36,045	0.202	73

8.3 Traffic Impacts

As discussed in Section 4.1, the acceptable traffic budget for the BRBH permissible under SSD-6324 is 508 trips and 977 trips in the AM and PM peak hours, respectively. The forecast traffic generation for the Proposal and other approved or constructed developments in the BRBH has been assessed cumulatively and is summarised in **Table 6**.

Table 6: BRBH Traffic Generation Balance

	AM Peak Trips	PM Peak Trips
BRBH TIA Budget	508	977
Lot 3 - Bunnings (approved)	(-) 100	(-) 300
Lot 4 - Proposal	(-) 73	(-) 73
Lot 6 – CFC (built)	(-) 48	(-) 60
Lot 8 – Steelforce (built)	(-) 21	(-) 21
Remaining Balance	266	610

The AM and PM peak hour trips forecast to be generated by the Proposal represents 14% and 7% respectively of the permissible traffic budget and falls well within the threshold outlined for the approved BRBH. Further, the cumulative traffic generation of the Proposal, alongside the approved Bunnings development and the completed CFC and Steelforce developments, accounts for 48% and 47% of the permissible AM and PM peak hour traffic budgets.

While the cumulative traffic represents less than 50% of the permissible traffic budget, it is critical to note that 80% of the total Lot areas have now either been developed (Lot 6 – CFC and Lot 8 – Steelforce), have an approved development (Lot 3 – Bunnings) or will accommodate the Proposal (Lot 4). Therefore, it is clear that the form of development that was originally envisaged under the BRBH TIA has not been realised, and the development that is being delivered is less intensive from a traffic generation perspective.

Finally, it is noted that the Skyline Crescent / Bringelly Road intersection that has been delivered represents the ultimate intersection assessed under the BRBH TIA. Therefore, it is concluded that the Proposal is supportable from a traffic impact perspective.

9 Construction Traffic Management

9.1 Draft Construction Traffic Management Plan

A Construction Traffic Management Plan (CTMP) will be provided as part of future construction planning, noting that at this time the details of the construction program are largely unknown other than an estimate of 6 months to undertake the construction works. It is expected that during the most intensive phase of construction, it is estimated that 60 contractors could be on-site at any one time. It is noted that this estimate requires further consideration when a Contractor has been appointed. Notwithstanding, sections below outline the general principles for managing construction traffic through the construction period.

9.2 Potential Haulage Routes

The primary construction vehicle route to and from the Site would be via Bringelly Road, with the majority of trips expected to be generated to/from the east. Given that this route is an RMS Restricted Access Vehicle (RAV) route, it would provide for all general and RAV construction vehicles.

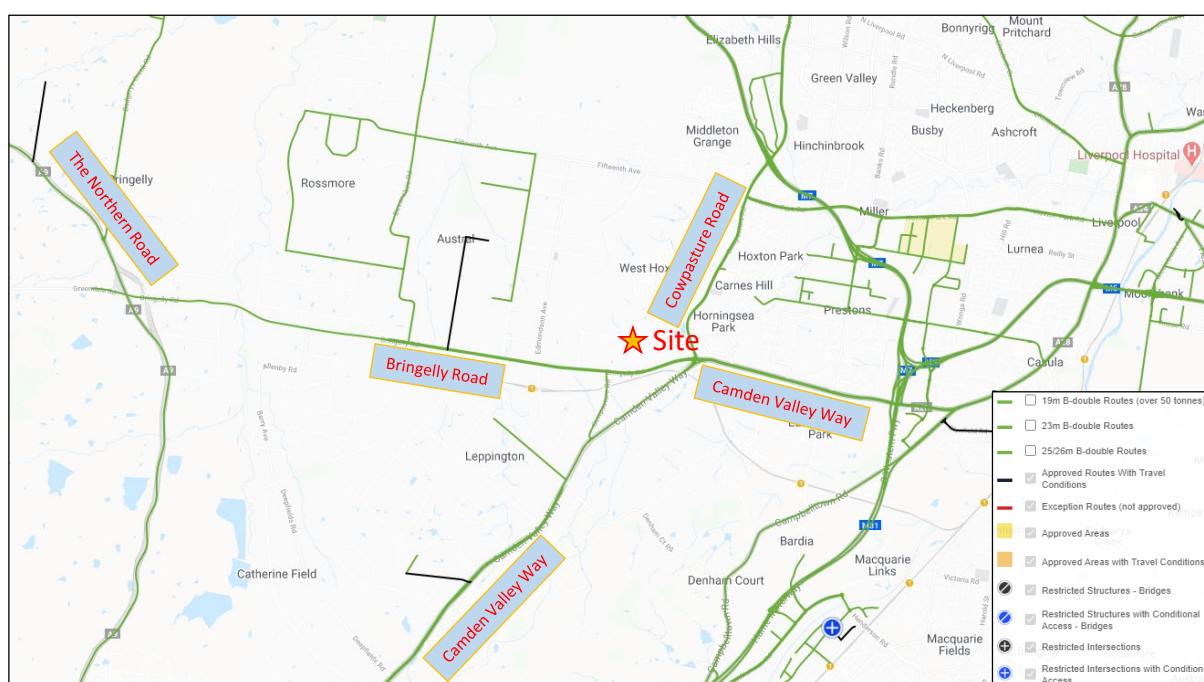


Figure 12: RMS RAV routes (Source RMS)

The movement of construction materials would be managed through the scheduling of deliveries, and would generally provide for minimal staff and truck movements during the peak periods.

9.3 Proposed Work Hours

It is expected that construction works would be undertaken during standard working hours, which are assumed to be as follows:

- Monday to Friday: 7:00 AM to 3:00 PM
- Saturday: 8:00 AM to 1:00 PM
- Sunday and public holidays: No planned work.

9.4 Construction Traffic Generation

Light vehicle traffic generation would be associated with construction staff movements to and from the Site. Based on the work hours outlined above, it is not expected that any additional trips would be generated during the traditional commuter peak hours (7:00AM – 9:00AM and 4:00PM – 6:00PM) with staff expected to arrive between 6:30AM - 7:00AM prior to starting a shift and depart between 3:00PM – 3:30PM following the shift end.

Similarly, further to appropriate scheduling of construction deliveries, it is not expected that more than 4 truck trips would be generated in the AM and PM peak periods.

As such, the additional construction vehicle trip generation of the Site is expected to have no impact on the operation of the local road network, notably when considered against the operational traffic generation.

9.5 Construction Staff Parking

Given the large size of the Site, it is anticipated that all construction staff parking would be accommodated within the boundaries of the Site within temporary parking areas. As such, it is expected that the Site would suitably be able to provide for parking for the peak construction staff.

9.6 Construction Mitigation Measures

While the traffic impacts of construction are likely to be negligible, the following measures are expected to be further investigated in order to minimise the impacts of the construction activities on the local road network:

- Traffic control at the Site access point from Skyline Crescent;
- Scheduling of deliveries outside of the commuter peak; and
- Appropriate approvals for any over-sized vehicle deliveries.

10 Access, Parking and Servicing Design

10.1.1 Design Standards

The Site's access, car park and loading areas have specifically been designed with reference to the following Australian Standards:

- AS2890.1 for car parking areas;
- AS2890.2 for commercial vehicle loading areas; and
- AS2890.6 for accessible (disabled) parking.

10.1.2 Access Driveways

All access driveways (to the internal road network) have been designed with reference to AS 2890.1 and AS 2890.2, with service driveways providing for vehicles up to and including a 26m B-Double. It is anticipated that full access driveway design compliance with AS 2890.1 and AS 2890.2 would form a standard Condition of Consent further to approval.

10.1.3 Parking Areas

All parking areas, including access aisles and parking modules, have been designed with reference to AS 2890.1 and AS 2890.6. It is anticipated that full parking area design compliance with AS 2890.2 would form a standard Condition of Consent further to approval.

10.1.4 Service Areas

All service areas have been designed with reference to AS 2890.2, and again provide for the movement of vehicles up to and including a 26m B-Double. It is anticipated that service area design compliance with AS 2890.2 would form a standard Condition of Consent further to approval.

10.1.5 Internal Circulation

The warehouse circulation roadways have been designed for one-way movement. Heavy vehicles will enter and exit the Site in a forward motion through two separate driveways.

11 Conclusions

Ason Group has been engaged by ESR Australia to prepare a Transport Assessment to support a staged SSDA for an industrial warehouse at Lot 4, Bringelly Road Business Hub (BRBH), Leppington. Further to a detailed assessment of all relevant traffic and transport issues, Ason Group provides the following conclusions:

- The Site is located within BRBH and is well located for an industrial development, with excellent potential for future vehicular and public transport connections to the sub-regional and regional network, as well as key growth centres across Western Sydney.
- The Site is well serviced by active transport infrastructure, with quality footpaths in all local streets, and dedicated cycle routes that are well-connected to the local and broader cycle network.
- Access to the Site will be provided via Skyline Crescent, which connects to the regional road network via Bringelly Road. The recently completed intersection of Bringelly Road & Skyline Crescent has been designed and constructed to accommodate the traffic generation of a fully developed BRBH and background traffic growth to 2031.
- The traffic generation rate adopted as part of this assessment is consistent with RMS traffic studies for business park estates, and is in line with the Steelforce assessment, within Bringelly Road Business Hub.

The assessment adopts a trip rate of 0.202 trips per 100m² in the AM and PM peaks.

- The Proposal is forecast to generate 73 trips in the AM and PM peak hours. The cumulative traffic generation of the Proposal and the Bunnings, CFC and Steelforce developments account for 48% and 47% of the permissible AM and PM peak hour traffic budgets as per SSD-6324.

While the cumulative traffic represents less than 50% of the permissible traffic budget, it is critical to note that 80% of the total Lot areas have now either been developed (Lot 6 – CFC and Lot 8 – Steelforce), have an approved development (Lot 3 – Bunnings) or will accommodate the Proposal (Lot 4). Therefore, it is clear that the form of development that was originally envisaged under the BRBH TIA has not been realised, and the development that is being delivered is less intensive from a traffic generation perspective.

Finally, it is noted that the Skyline Crescent / Bringelly Road intersection that has been delivered represents the ultimate intersection assessed under the BRBH TIA. Therefore, it is concluded that the Proposal is supportable from a traffic impact perspective.

- Car parking has been provided in accordance with the rates detailed in the Bringelly Road Business Hub SSDA approval, and includes an appropriate allocation of accessible parking spaces as per Liverpool DCP.
- All access driveways, parking areas and service areas have been designed with reference to the appropriate Australian Standards and for 26m B-Double access. It is anticipated that full design compliance with the relevant Australian Standards would form a standard Condition of Consent further to approval, which will also provide for any minor design changes if required.

It is therefore concluded that the proposed development at the Site is supportable on transport and traffic planning grounds.

Appendix A

Swept Path Analysis



Revision notes:		
Rev:	Date:	Notes:
For information purposes only - not for construction		

Drawn By: AT
Client: ESR Australia

Project: 1453 Lot 4, Bringelly Road Business Hub
Drawing Title: Design Advice - 26m B-double Warehouse Circulation

Date: 14-Aug-20
Scale @ A3: [scale]
Drawing Number: AG01



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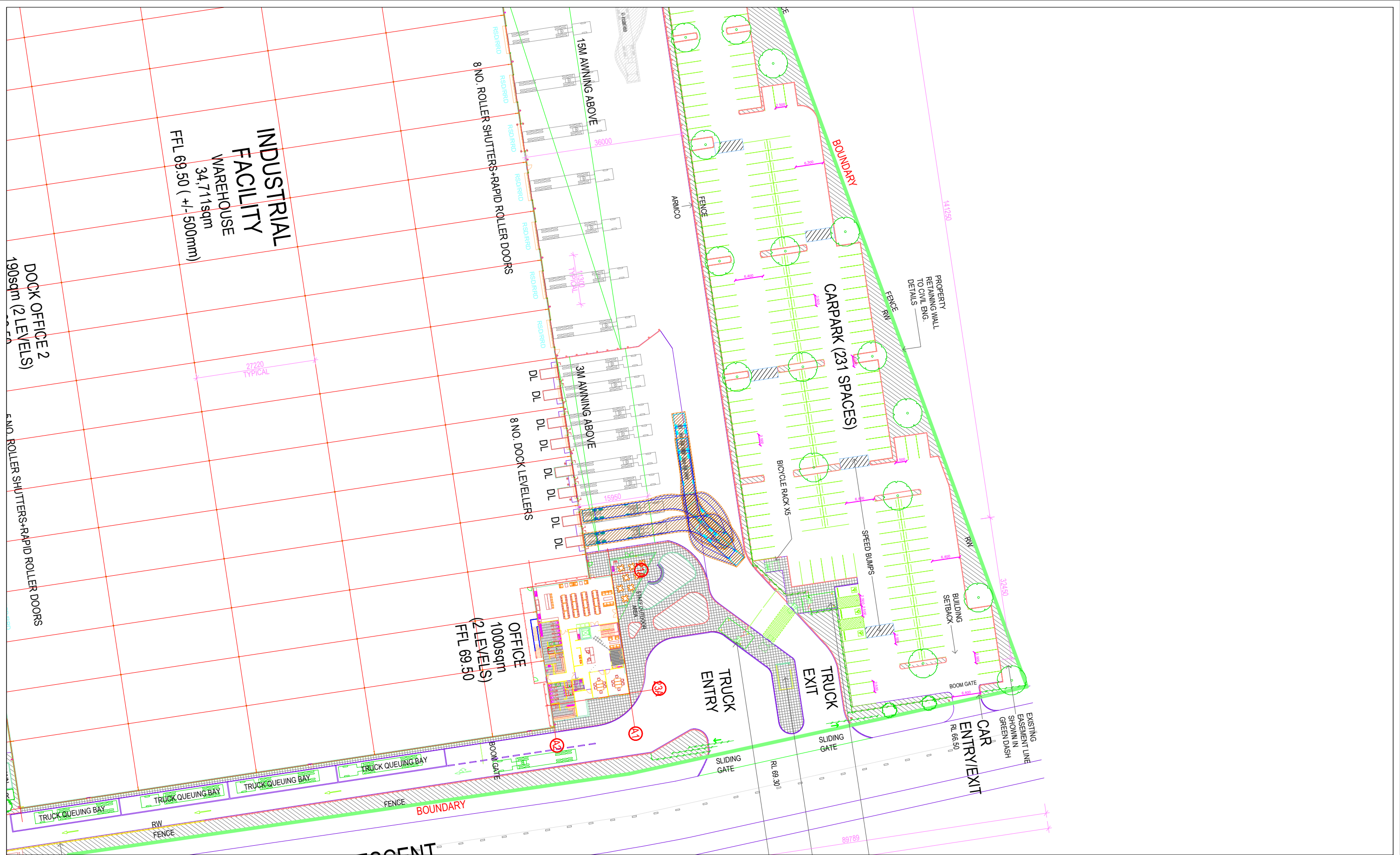


Revision notes:		
Rev:	Date:	Notes:
For information purposes only - not for construction		

Drawn By: AT
Client: ESR Australia

Project: 1453 Lot 4, Bringelly Road Business Hub
Drawing Title: Design Advice - 19m AV Warehouse Loading Bay Swept Paths

Date: 14-Aug-20
Scale @ A3: [scale]
Drawing Number: AG02



Revision notes:			Drawn By:		Project:		Date:		<div></div> <div>Suite 5.02, Level 5, 1 Castlereagh Street Sydney NSW 2000</div> <div>info@asongroup.com.au</div>	
Rev:	Date:	Notes:	AT		1453 Lot 4, Bringelly Road Business Hub		14-Aug-20			
			Client:		Drawing Title:		Scale @ A3:			
			ESR Australia		Design Advice - 12.5m HRV Warehouse Loading Bay Swept Paths		[scale]			
For information purposes only - not for construction							Drawing Number:			
							AG03			